PRESENTING

Advanced Communication Riser

Open Industry Standard

ACR
ADVANCED COMMUNICATIONS RISER

www.acrsig.org

Agenda

- ACR Special Interest Group- Introduction
  - Richard Baek
- ACR Standard Here and Now
  - M. Consuelo Ortiz

ACR Special Interest Group

Richard Baek

ACR SIG - Managing Director

San Jose January 23-24, 2001 - Taipei February 14-15, 2001

Agenda

- ACR SIG Overview
  - Charter and focus
  - Membership Benefits
- Momentum Behind ACR SIG
- ACR SIG Commitment to Success
- Summary

ACR SIG Overview

- An open industry non-profit corporation
- Membership levels include Promoters, Participants, and Adopters
- Chartered to develop and accelerate industry wide adoption of a common architecture for an open specification for advanced PC communication riser card
  - Analog modem
  - Networking: Ethernet, wireless, and phone-line, etc.
  - DSL
  - Audio functions

ACR SIG Overview (con't)

- Immediately available solution for scalable standard interface that enables WAN/LAN
- Features include:
  - Backward compatible with legacy AMR (Audio Modem Riser) cards
  - Increased flexibility for product differentiation and integration
  - New bus structure increases flexibility, longevity and future enhancements potential

Membership Benefits

- Participate in spec development (Promoter/Participants)
- Automatic timely access to ACR specifications
- Access to members only (Participants/Adopters) web site areas
- Email updates on ACR developments
- ACR SIG exclusive event participation
  - I.e. Taiwan Plugfest and Technical Training
- Marketing programs

Momentum Behind ACR SIG

ACR SIG Members

- 3Com
- Acer Laboratories Inc. (ALi)
- Agere Systems (formerly Lucent Technologies)
- Alcatel
- Allayer Communications
- AMD
- Analog Devices, Inc.
- Aopen Inc.
- ArchTek Telecom Corporation
- Askey Computer Corporation
- ASUSTeK Computer Inc.
- Avance Logic, Inc.
- Biostar Microtech Int'l Corporation
- CastleNet Technology Inc.
- Chaintech Computer Co., Ltd.
- Clare
- Cologne Chip AG
- Conexant
- DFI
- D-Link Corporation
- EFA Corporation
- EliteGroup Computer Systems
- ESS Technology, Inc.
- First International Computer Inc. (FIC)
- FMMO Inc.
- Gigabyte Technology Co., Ltd.
- Hsing Tech.
- IC Ensemble, Inc.

ACR SIG Members (con't)

- Insyde Software Corp.
- Integrated Circuit Systems
- Iwill Corporation
- KC Technology, Inc.
- Lectron Co. Ltd.
- Matrox Graphics Inc.
- MicroStar, Inc. (MSI)
- Motorola
- NuVision Technology, Inc.
- nVIDIA Corporation
- Ocean Manufacturing, Inc.
- PCTEL, Inc.
- Phoenix Technologies, Ltd.
- Quanta Computer
- SigmaTel, Inc.
- Silicon Integrated Systems (SiS)
- Smart Link Ltd.
- Sota
- Standard Microsystems Corp. (SMSC)
- TECHGEN Inc.
- Texas Instruments (TI)
- T-Square Design, Inc.
- TurboComm Tech. Inc.
- VIA Technologies
- Well Communication Corp.
- Wolfson Microelectronics Ltd.
- Xware Corp., Inc.

ACR SIG Building Momentum

- 1.0 Specification under membership review
- Motherboard products/designs available:
  - VIA - VT5365, PLE133 (VT8601 + VT8231), VT5274, KT133 (VT8363 + VT8231) VT5347, PRO266 DDR (VT8633 + VT8233)
  - Chaintech - 6VJD2, PRO266 DDR (VT8633 + VT8233)
  - SiS - 730S
- Riser Card products/designs available:
  - AMD – CCR, CCR-U, CCR-E, CCR-H
  - Conexant – Smart AMC, Smart MC
  - PCTEL – Communication Combo Card
  - Smart Link – Smart Riser 56 – ACR
  - Well Communication Corp. – Communications Combo Card

ACR Riser Card Types

- **ACR.Basic** — ACLink, USB, and ACR Serial
- **ACR.Lite** — MII (1), ACLink, USB, and ACR Serial
- **ACR.Hub** — MII (1), ACLink, USB, ACR Serial, and MII (2)
- **ACR.Plus** — MII (1), ACLink, USB, ACR Serial, and IPB
- **ACR.Extreme** — MII (1), ACLink, IPB, USB, ACR Serial, and MII (2)
- **ACR.RFX** — MII (1), ACLink, USB, ACR Serial, IPB, and Wireless

ACR SIG Commitment to Success

ACR SIG Commitment

- **Mobilization of Vital Technical Marketing, Inc.**
  - Operations Management
  - Marketing and Event Management
  - Member Communications
- **Worldwide industry enablement**
  - ACR Plugfest (Domestic and International) – February 12 and 13, 2001
  - Technical training - February 12, 2001
  - ACR self-testing Designed for Windows Logo program
- **Evangelism**
  - Platform Conferences, System Builders Summit, Cebit, WinHEC, Computex, Comdex, Strategy 2001, etc.

ACR Presentations

- ACR Standard - Here and Now (Consuelo Ortiz / AMD)
- ACR Enumeration (Terry Cole / AMD)
- IPB Architecture and Uses
  - *Supporting Broadband Connectivity - the Integrated Packet Bus (IPB)* (Author: Steven E. Strauss / Agere Systems, formerly Lucent Technologies)
  - *Broadband, Wireless, beyond the Integrated Packet Bus (IPB)* (Author: Conrad A. Maxwell / Conexant)
- ACR – A Flexible and Inexpensive Alternative to Multiple PCI Cards (Leor Brenman / Smart Link)
- Core-logic Integration and ACR Application (Eric Yu / PCTEL and Benjamin Pan / VIA Technologies

ACR Summary

- Open specification for advanced PC communication riser card
- Worldwide industry momentum building rapidly around ACR
- ACR SIG is firmly committed to successful enablement of our technologies

Contacting ACR SIG

ACR Special Interest Group
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www.acrsig.org

Please stop for an informational package at
our exhibit booth #17 in San Jose, CA or booth #18 in Taipei, Taiwan

The ACR standard here and now

M. Consuelo Ortiz
Advanced Architectures Lab
Business Development
AMD

San Jose January 23-24, 2001 - Taipei February 14-15, 2001

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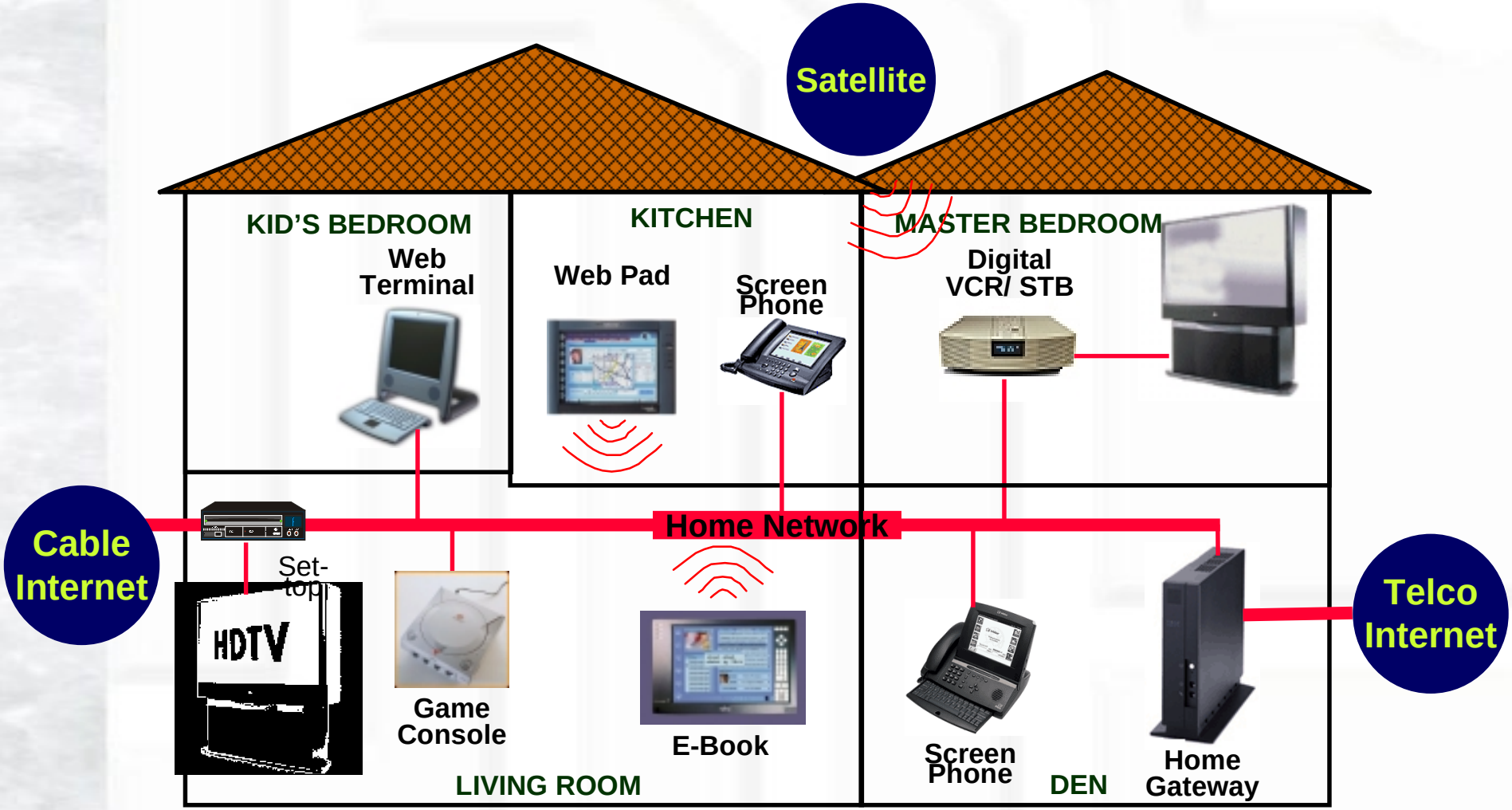
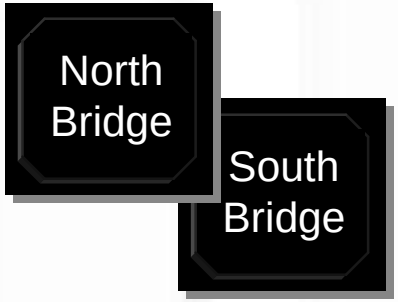
- The ACR Initiative
- ACR Status
  - Chipsets
  - Motherboards
  - Riser Cards


Satellite
KID'S BEDROOM
Web Terminal
KITCHEN
Web Pad
Screen Phone
MASTER BEDROOM
Digital VCR/ STB
Cable Internet
Home Network
Telco Internet
Set-top
HDTV
Game Console
E-Book
LIVING ROOM
Screen Phone
DEN
Home Gateway

System Trends

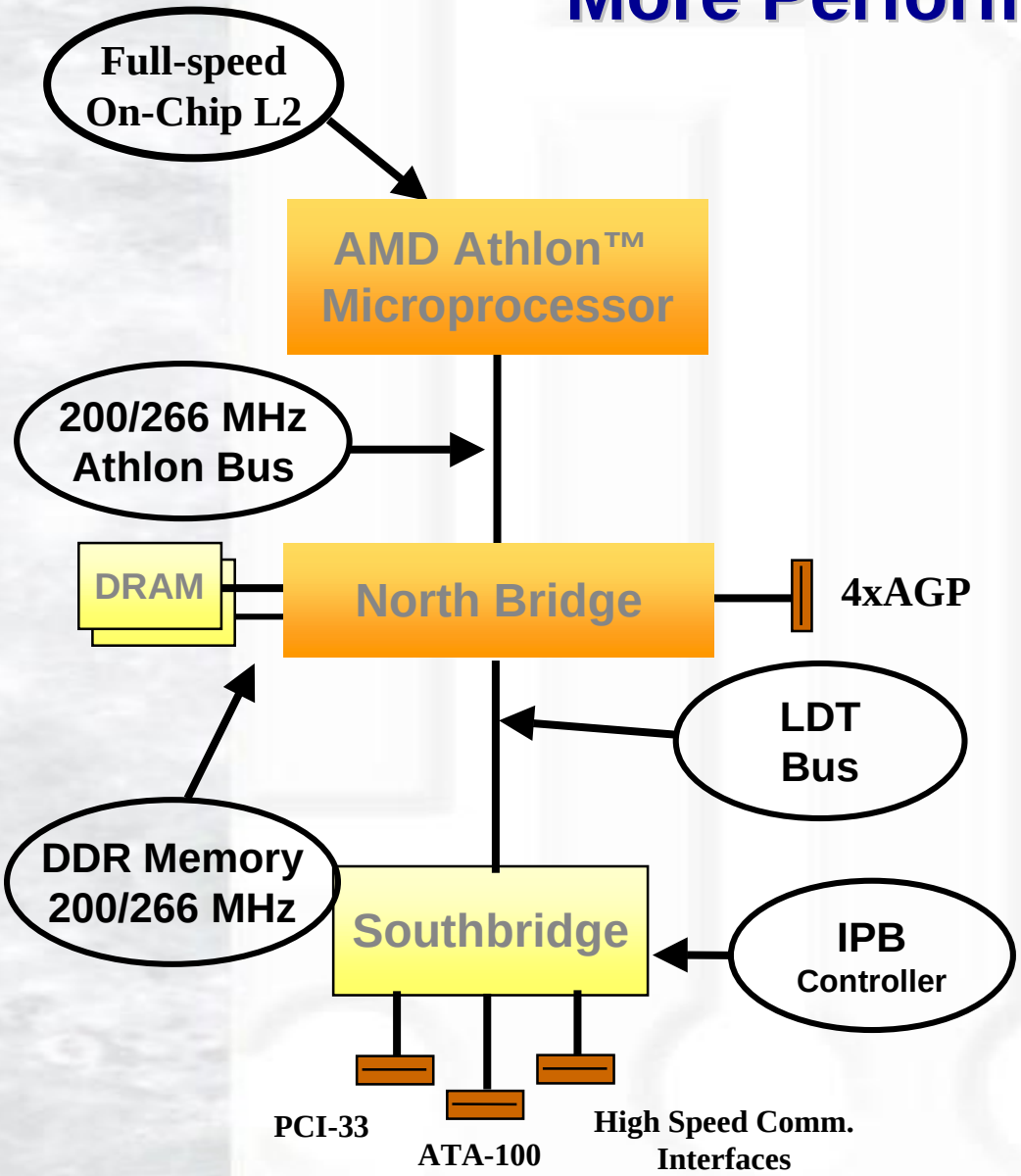


- AMD Athlon™
- Integrated SMA 3D Graphics
- AGP 4X interface
- PC100 and PC133 Memory
- Dual Bus Mastering IDE
- AC-97
- Ethernet Interface
- Super I/O
- USB ports

- **Highly Integrated Silicon**
  - Fewer chips with more functions
    - For example, integrated graphics, audio and Comm
  - Lower costs needed to make PCs ubiquitous
- **More multimedia and communications**
  - Good graphics and audio are no longer luxuries for commercial systems, but requirements
  - LAN, cable modem, DSL and wireless technologies are linking all PCs together
- **All driving the need for much faster, low latency, universal interconnect in the box**
- **Connectivity outside the box: WAN & LAN**

AMD Athlon™ Platform

More Performance Ahead



AMD Athlon

On-Chip full-speed L2 caches
Up to 2 MB on-chip full-speed L2 cache
Clock Speed, Clock Speed, Clock Speed

266MHz Front-Side Bus (FSB)

AMD will debut a 266MHz FSB in 2000; increasing the bandwidth of our industry leading 200MHz bus by 33%

PC2100 & PC1600 DDR Memory

Lowest latency and highest bandwidth (to 2.1 GB/sec) PC memory

Lighting Data Transport™ (LDT)

Provides bandwidth and isosyncronous capability for next generation I/O integration

Multi-Processor

True multiprocessor chipset with a dedicated 266MHz Athlon bus per processor
IGD4 (2-way) scheduled for 2H'00.

Advanced Communication Riser

Common architecture for analog modem, Ethernet, phoneline and wireless networking, DSL, and audio functions

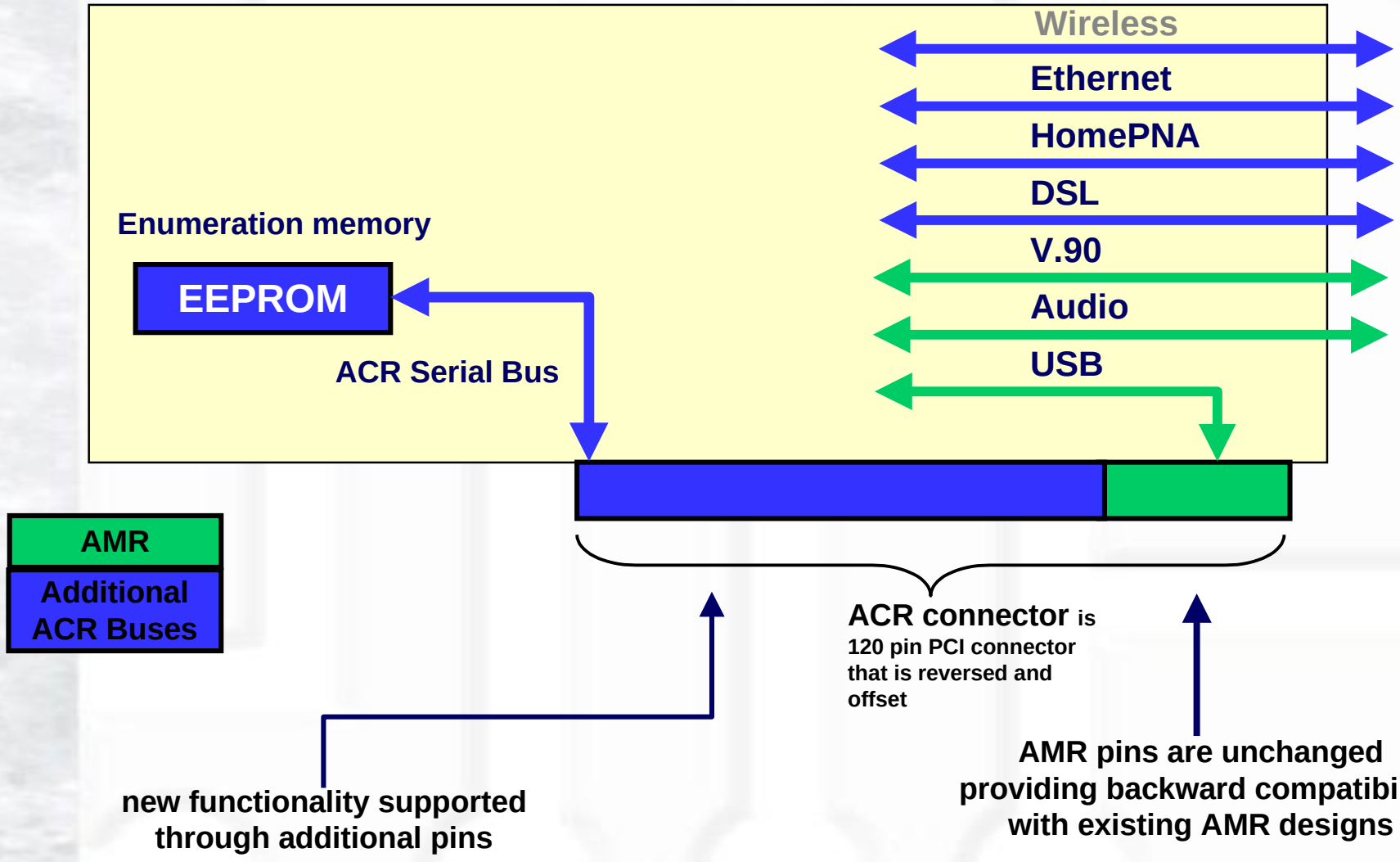
The Need for a New Riser

- To reduce communications peripheral development costs
- To answer demand for emerging and new communications technologies
  - Accommodates the communications technology advances while mitigating the impacts of a standards change
- To allow multiple generations of core logic, peripheral components, and software emulators to implement a specification without frequent motherboard architecture changes

ACR Strategy

- Support architectures that serve different market segments
- Improve on PCI solutions
- Enable reductions in size and cost
- Enable soft and semi-soft solutions
- Ease logo certification

ACR Concept Diagram



ACR is an Evolutionary Upgrade

- **Backward compatible with AMR**
  - **Supports legacy AMR riser designs for modem and audio Codecs**
  - **AMR cards plug into the ACR slot and work without modification**
- **Eliminates enumeration and Plug-n-Play challenges**
  - **With the addition of EEPROM/PROM and new signals**
  - **Existing AMR designs can be easily modified to take advantage of these new capabilities**

ACR Interfaces

- ACR is based on exiting technologies
  - AC'97
    - Supports audio and or modem functions
  - MII Interfaces
    - Supports one of two LAN interfaces
  - IPB
    - Broadband connectivity
  - USB
- ACR.Basic, ACR.Lite and ACR.Hub are buildable today
  - In addition chipset vendors are sampling solutions that include an integrated LAN/WAN controllers

Improved Enumeration

- Improved enumeration using serial EPROM
  - Speeds WHQL acceptance
  - An ACR riser card can be self tested independent of the motherboard
- Working very close with Microsoft WHQL team
  - Joint development of test assertions and ACR HCTs

Single Motherboard

- **Single motherboard design can be used in multiple SKUs**
  - **This protects the investment in motherboard design and layout**
    - **Changes to motherboard designs to provide new functionality can be risky**
  - **Greater economies of scale can be achieved**
    - **Same connector as PCI**
    - **Same motherboard supplies multiple SKUs**

Diverse and scalable

- **Configure To Order (CTO) and Build to Order (BTO) WAN/LANS**
  - **Allows diverse and scalable communications, networking and audio functions in a flexible combination of hardware and software cores**
  - **The ACR cards define the platform's WAN/LAN capability at the factory**
    - **As many or as few technologies as appropriate**
    - **Several hard/soft partitions of solutions to provide maximum flexibility with one architecture**

Some ACR Configurations

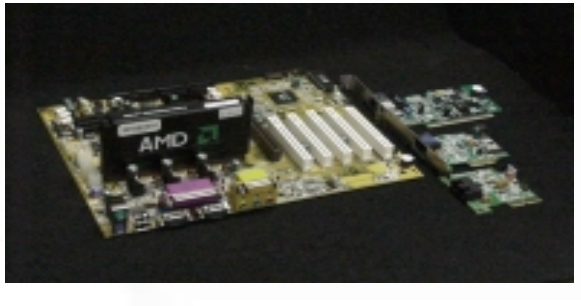
- ACR Basic
  - USB, AC97, SMBus
- ACR Lite
  - USB, AC97, SMBus, Integrated MAC w/ MII or GPSI
- ACR Hub
  - USB, AC97, SMBus, (2x) Integrated MAC w/ MII or GPSI

Sell-up

ACR.Hub

ACR.Lite

ACR.Basic



Other Advantages

- **Riser combo functionality frees up PCI slots**
  - **A Communication device will use at least on PCI slot**
    - **If you commit one slot to a communication solution then ACR offers and advantage**
      - **Enables multiple network connectivity with a single card**
  - **With ACR.Lite you can implement a home Gateway solution now**

ACR Status

Where is ACR today

- Standard is ready
  - Specification 1.0 available to members
- First WHQL Approval
  - Smart Link - Data Fax Modem logo
  - In the pipeline
    - Conexant, Lucent, PCTEL, and Sigmatel
- Integrated Packet Bus (IPB)
  - IPB Controller under development
- Industry support

ACR
WHQL Logo Program

- Plan was defined as a sequence of four steps
  - Step 1: Establish processes for an ACR capable system logo and an ACR device logo. In this step the MB and devices will be logo'd as a combination
  - Step 2: Establish a small set of reference ACR motherboards and tests for ACR device vendors
  - Step 3: Establish a set of reference ACR devices and tests for ACR motherboard vendors
  - Step 4: Self-testing by all ACR vendors
- Step 1 is completed
- Step 2 in process

WHQL Work

- Microsoft & ACR SIG are working together
  - Developing test assertions and HCTs
- First ACR hardware was submitted to WHQL
  - Using existing HCTs to test that hardware
    - Audio, Net, and Modem HCTs for example
  - Adding tests for ACR specific functionality to HCTs
- Smart Link has received the first Data Fax Modem certified for Windows logo
- Long-range plan for enabling self-testing

Minimum System Requirements

- Motherboard Controllers
  - DC 97
  - USB
  - ACR Serial Bus (SMBus)
- Riser Devices
  - EEPROM

Chipsets

Chipset	ACR Basic	ACR Lite	ACR Hub
ALi 1535+	✔		
ALi 1535D+	✔		
SiS 635	✔	✔	
SiS 730S	✔	✔	
VIA 8231	✔	✔	
VIA 8233	✔	✔	
VT82C686A	✔		
VT82C686B	✔		
ES3481	✔	✔	✔

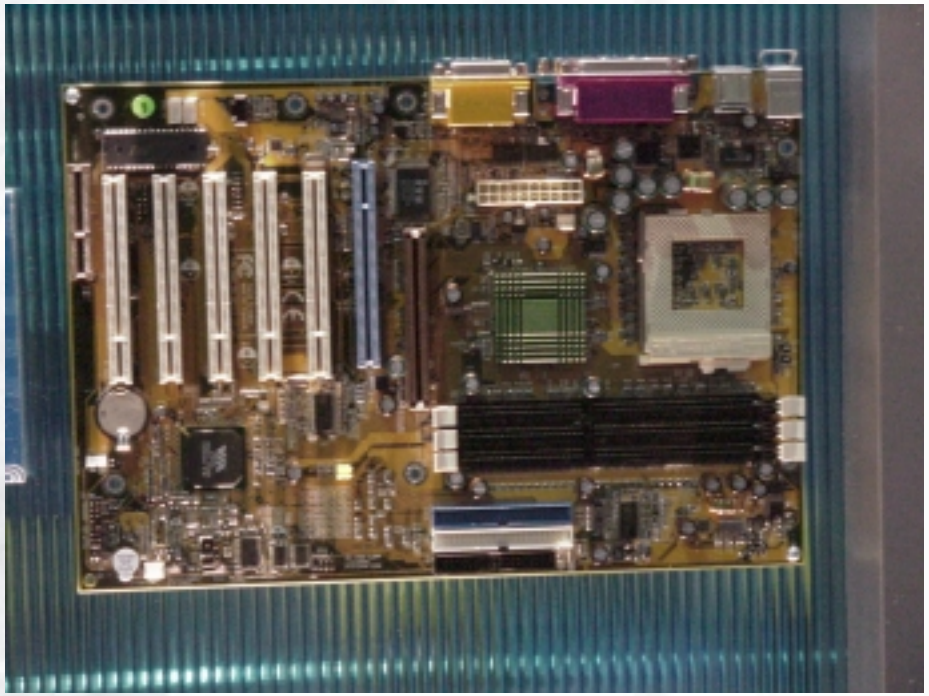
ACR MotherBoards

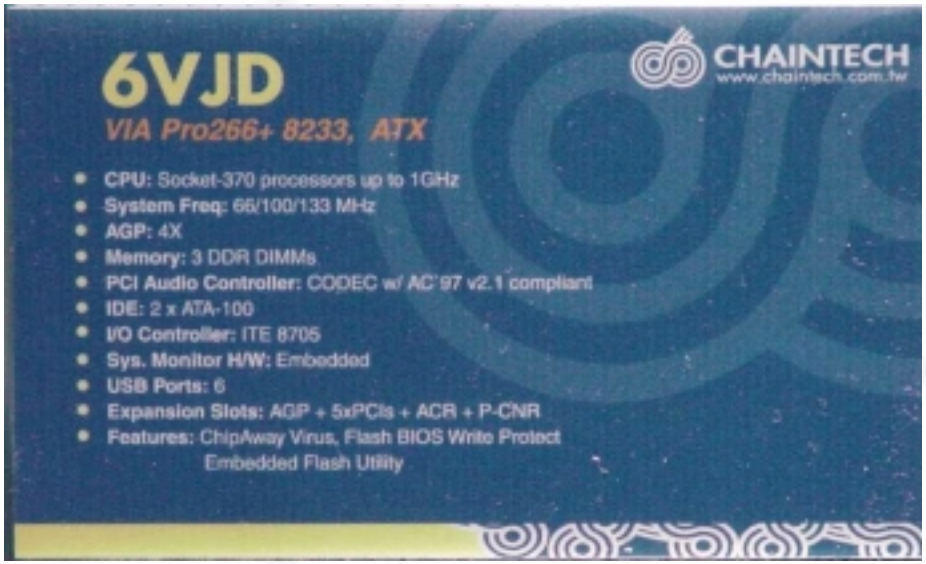
Asus	Intel PIII/Celeron	VIA 8633 + 8233	ACR.Lite
Biostar	Intel PIII/Celeron	VIA 8633 + 8233	ACR.Lite
	AMD Athlon/Duron	VIA 8366 + 8233	ACR.Lite
ChainTech	Intel PIII/Celeron	VIA 8633 + 8233	ACR.lite
DFI	AMD Socket A	SIS730	ACR.lite
ECS	Intel PIII/Celeron	VIA 8633 + 8233	ACR.lite
	AMD Athlon/Duron	VIA 8366 + 8233	ACR.Lite
Iwill	Intel PIII/Celeron	VIA 8633 + 8233	ACR.lite
Mitac	AMD Athlon/Duron	ALI 1647 + 1535D	ACR.Basic
	Intel PIII/Celeron	VIA 8633 + 8233	ACR.Lite

Biostar
(AMD IGD4/VIA 8231)

Chaintech

ACR / CNR, DDR, Intel Socket 370





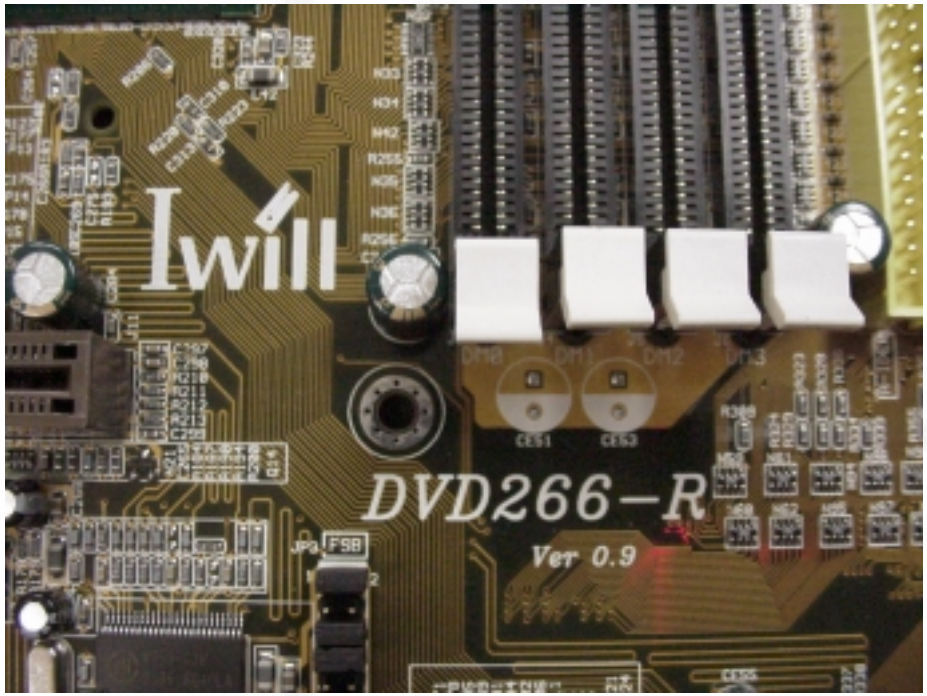
DFI Motherboard

SIS730, ACR, SDRAM, & AMD Socket A

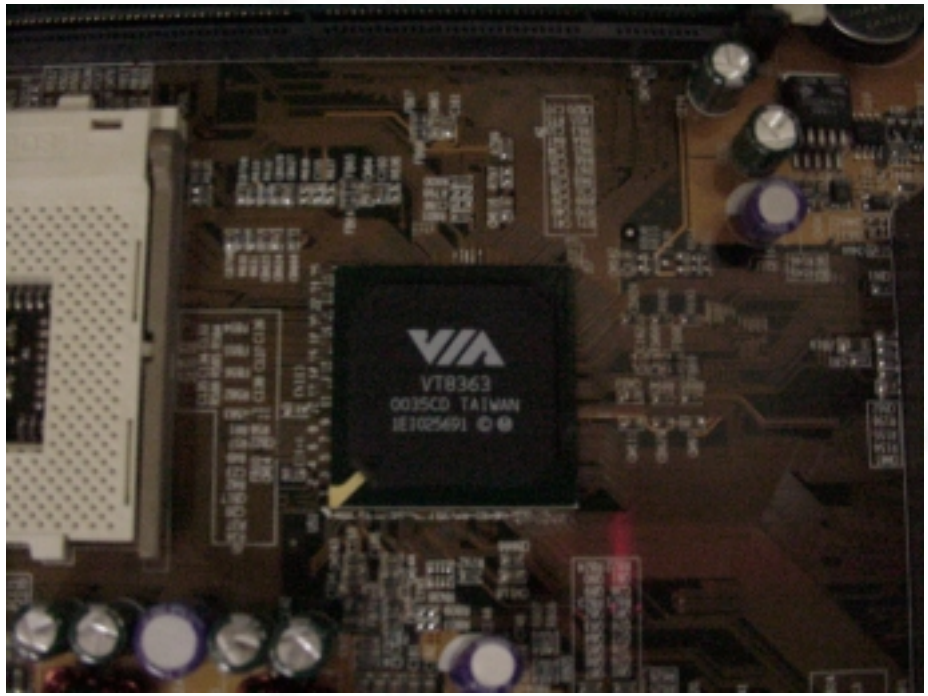
ECS
(VIA SB, ACR, DDR, Intel Socket 370

Iwill

2-P, ACR, DDR, VIA SB, Intel Socket 370 x2



VIA
5311B Prototype



SIS
Prototype

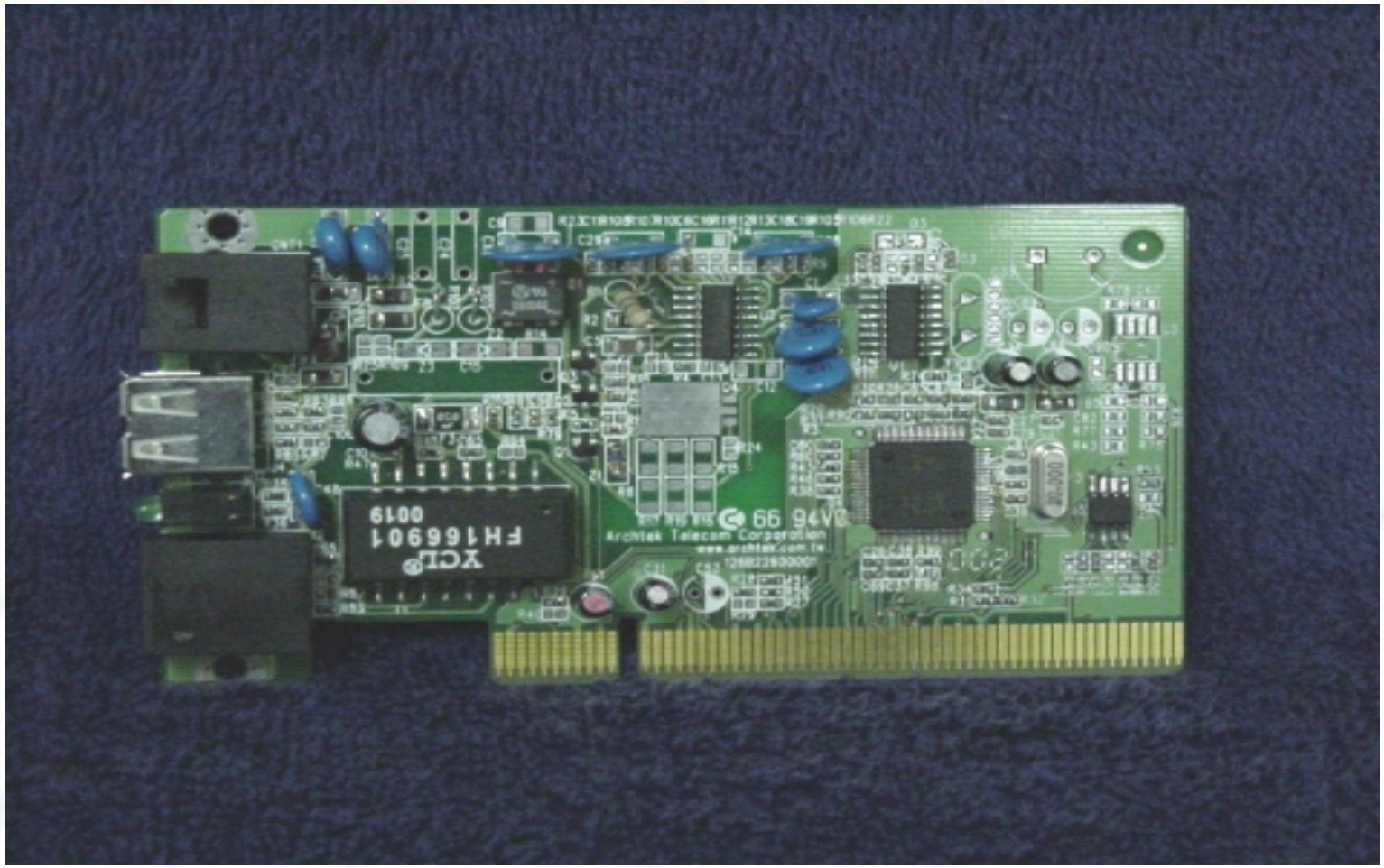
ACR Riser Cards

- ACR.Lite
  - Archtek, Well Communications and SmartLink have production worthy boards
  - Agere (Lucent), Conexant, Motorola, and PCTEL, have working prototypes
- ACR.Basic
  - Conexant, PCTEL, Smartlink, and Sigmatel have prototypes
- Other
  - 10/100 and HUB prototype from AMD
  - DSL Prototype with ADI
  - 6 channel Audio prototype from Sigmatel

AMD
ACR.Hub - Prototype

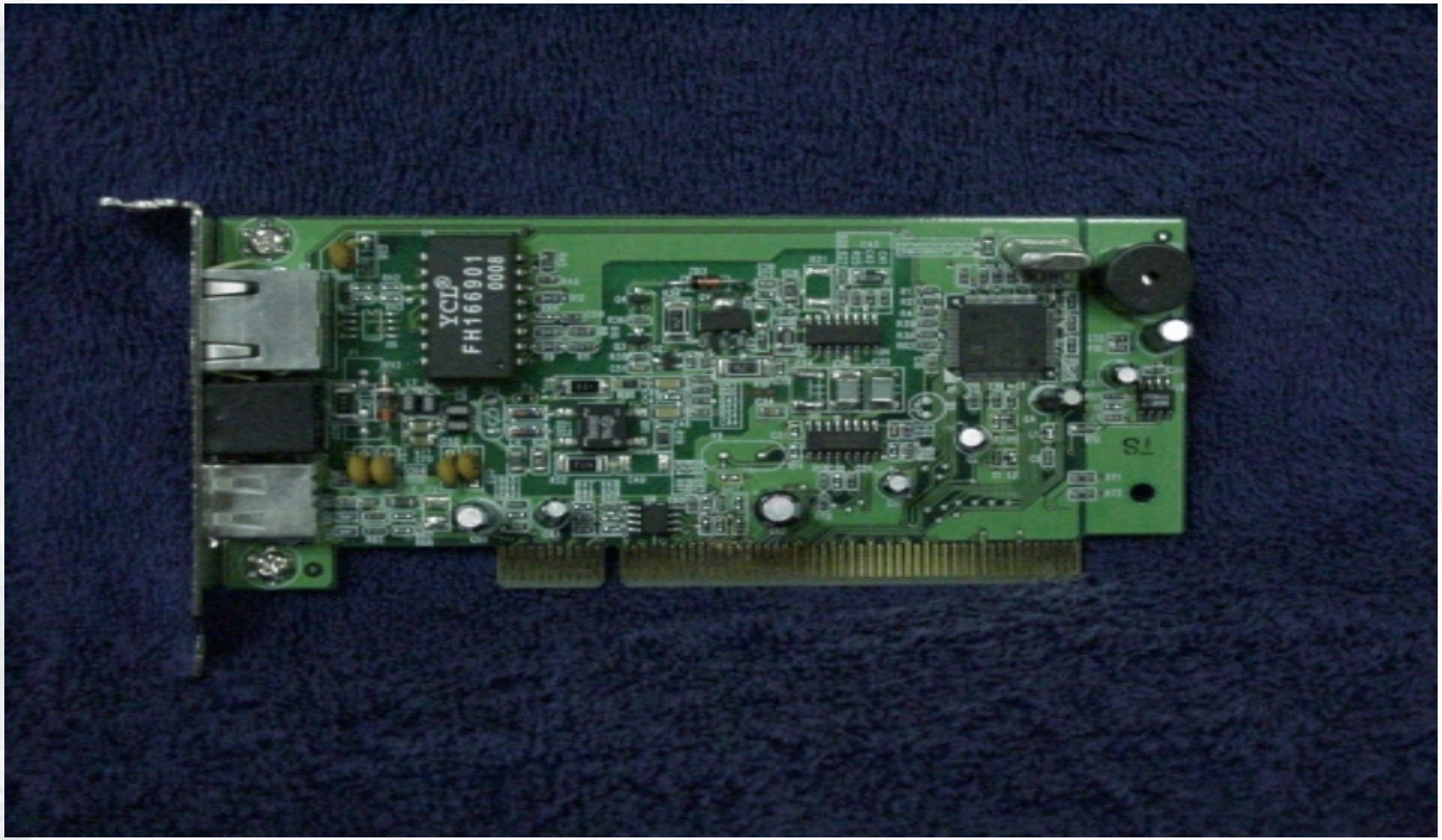
ArchTek

ACR.Lite: HPNA1.0 / Ethernet, V.90 & USB



ArchTek

ACR.Lite: HPNA, Ethernet, V.90 & USB



ArchTek

ACR.HUB 10/100 Ethernet, V.90 & USB to HPNA1.0

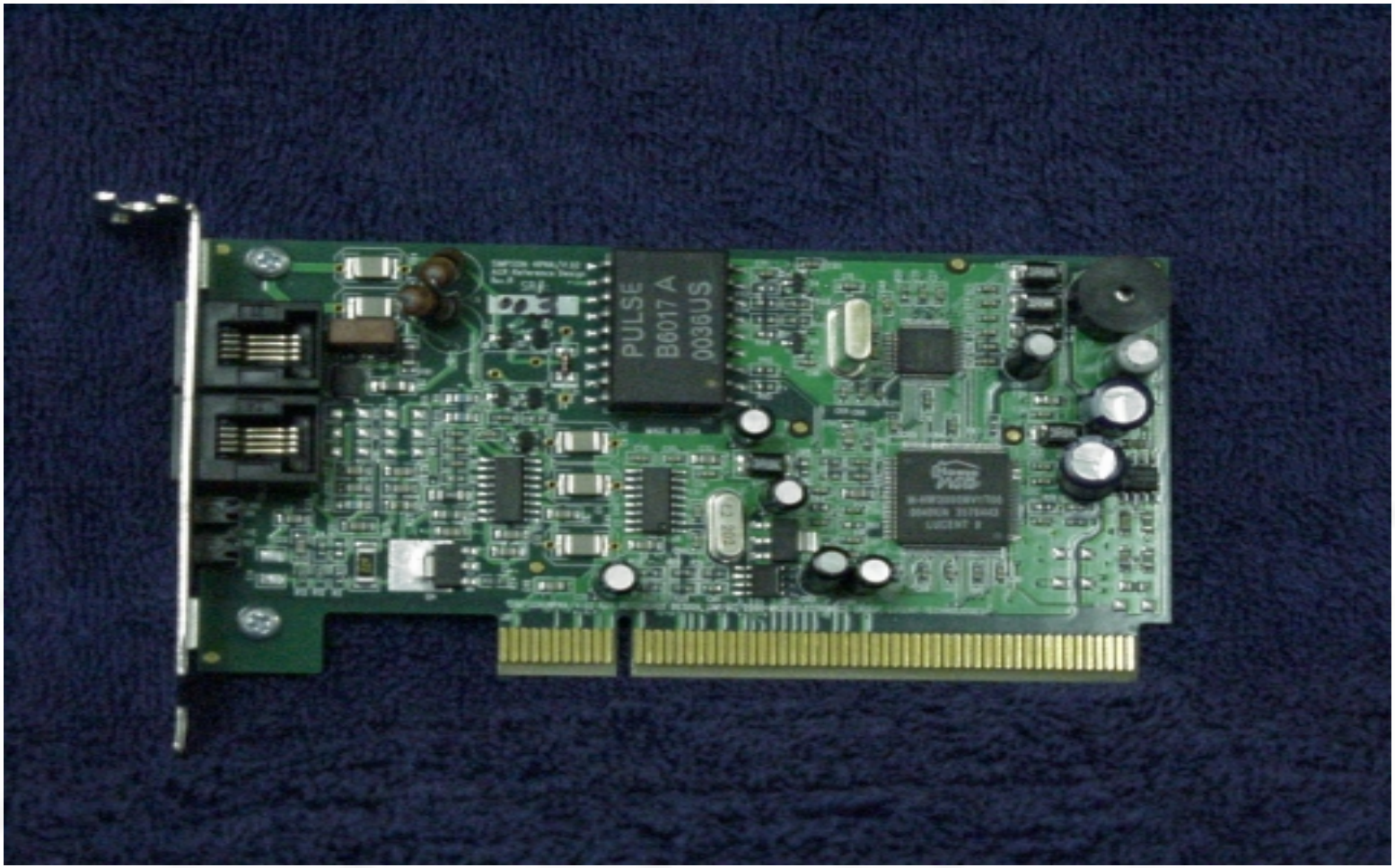
Conexant
Audio and Modem combo

Conexant

HPNA 2.0 combo with SmartMC V.93 soft modem

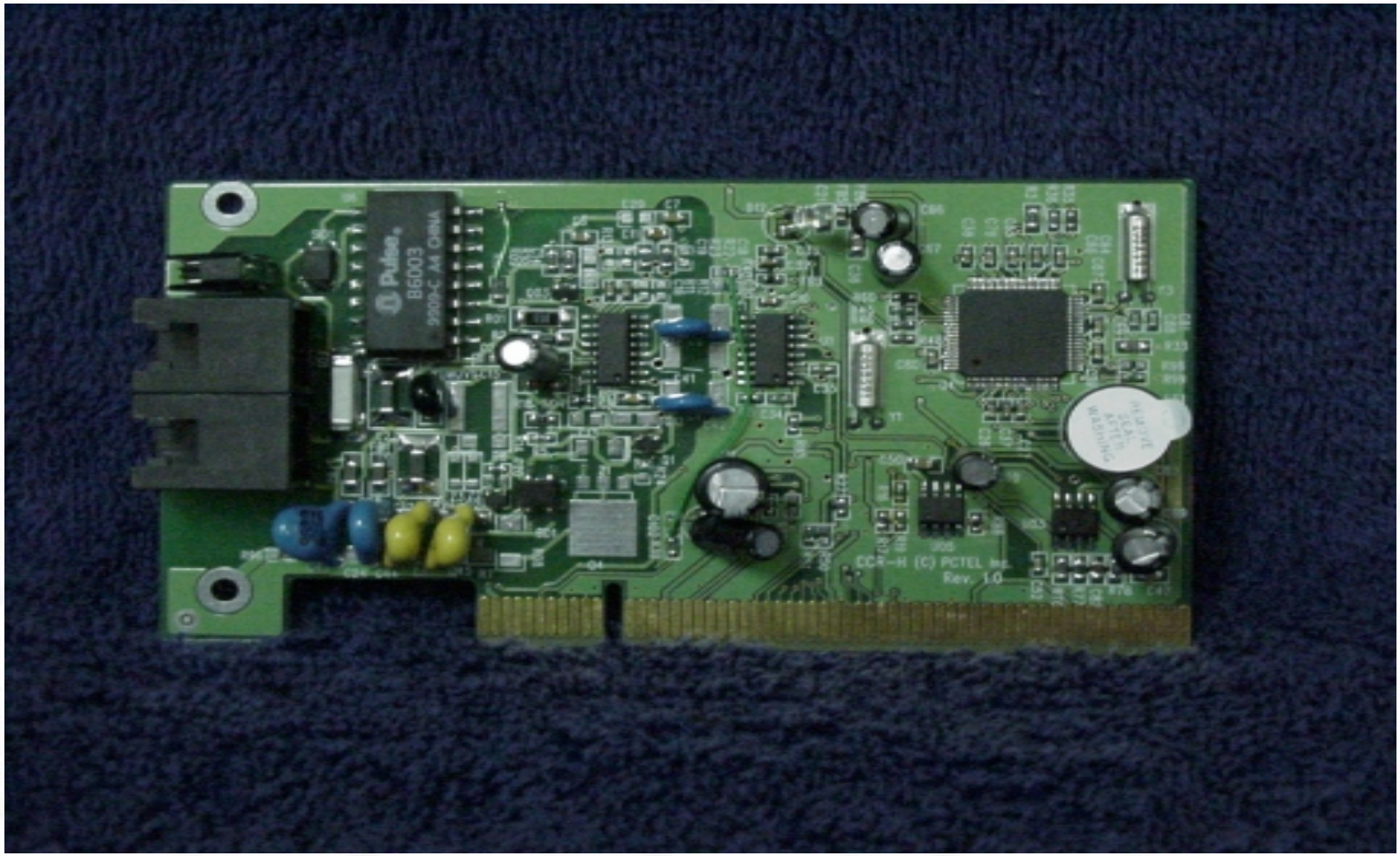
Lucent

ACR.Lite HPNA 2.0, & V.92



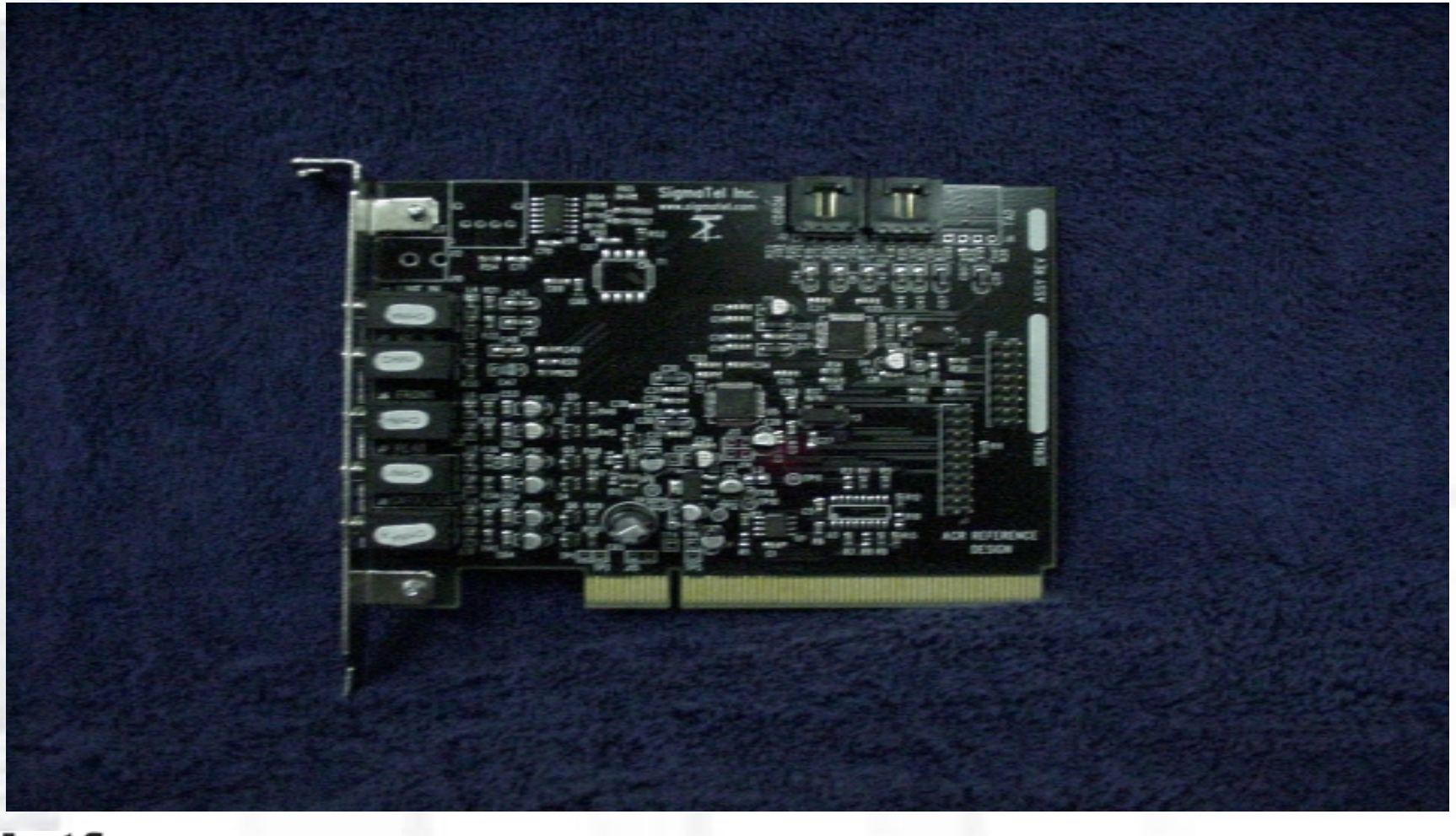
PCTel ACR.Lite

HPNA 1.0, & V.90



Sigmatel

SigmaTel



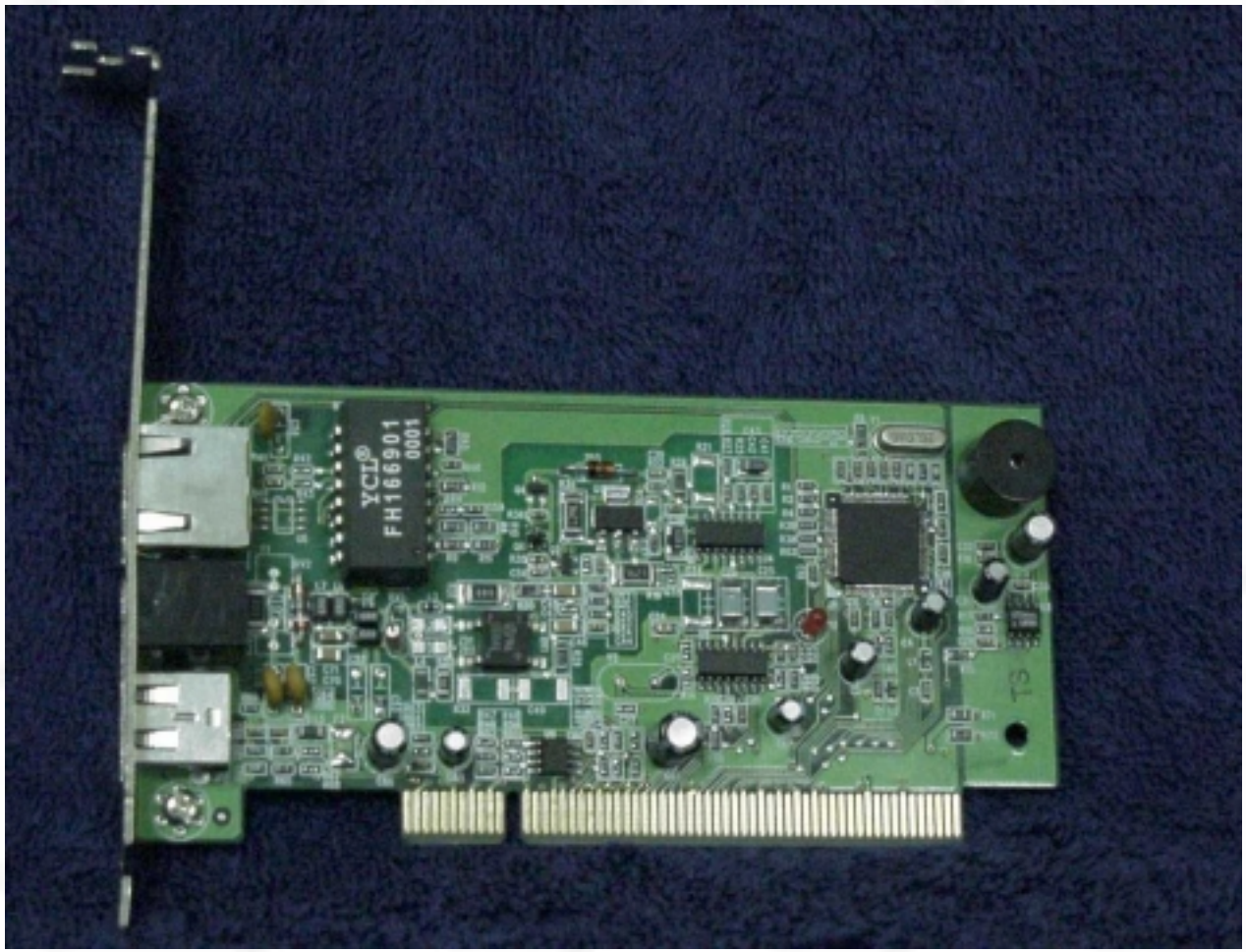
SmartLink ACR.Basic
V.90 and EEPROM

Well Communications

ACR.Basic Conexant V.90 & EEPROM

Well Communications

ACR Lite Card w/ HPNA 1.0 / E'net & SmartLink V.90



Well Communications

ACR Lite Card w/ HPNA 1.0 / E'net & SmartLink V.90

Well

ACR EEPROMS

- Microchip
  - Part 24LC09
- S Thompson
  - Samples available W12

Microchip ACR EEPROM

- I2C EEPROM with Device Address 1011xxx
- 8K Bits organized as 1K x 8
- Operating voltage:
  - +2.5V to +5.5V
- Standard Industrial Temperatures:
  - -40C to +85C
- 8-Lead SOIC package
- 100 KHz operation at 2.5 volts
- 16 byte page write buffer

Summary

- ACR is a key element for Communication enabled Platform
- ACR addresses market needs
  - Natural migration from existing solutions
  - Supports emerging and new communications technologies
- ACR offers scalability and flexibility
  - Single MB supports multiple SKUs
  - Offers multiple network connectivity on a single card
- ACR gains broad industry support
  - Over 55 members
  - Broad support from MBs riser card and chipset vendors

Key ACR sites

- ACR SIG
  - www.acrsig.org
- Microsoft WHQL
  - acrhelp@microsoft.com
- AMD ACR initiative
  - www.amd.com/devconn/acr.html

Thank you